

The Genealogy of Maryland Information Technology Company
Founders: Bioinformatics, Medical Informatics, Health Informatics

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The Genealogy of Maryland Information Technology Company Founders: Bioinformatics, Medical Informatics, Health Informatics³

The “family histories” of Maryland technology companies are intertwined stories of entrepreneurs, technologies, and corporate structure. This project has focused on the pathways taken by the people who founded the technology companies operating in Maryland today. But it has been of necessity a study of corporations that have grown and shrunk, restructured or moved away, merged or spunoff, and of successive generations of technology development in core fields like vaccines, genomics, and optics. The results will help the state refine its marketing to both companies and potential entrepreneurs and better understand and capitalize on its research institutions and other technology generators. The Milken Institute’s 2004 survey ranked Maryland 4th overall in its ratings of states best positioned to take advantage of opportunities for growth in the New Economy, based on high scores in educational attainment, R&D, and capital availability.⁴ It is clear from this study that these same strong fundamentals have been providing fertile soil for technology entrepreneurship for 25, 50, and sometimes 100 years.

Six sectors were examined: bioscience and biomedical instruments, information technology equipment and services, private research and development, energy/chemicals/materials, defense and aerospace, and high technology machinery and instruments. Each sector was characterized by different patterns of entrepreneurship.

Why Maryland?

The researchers sought to answer why entrepreneurs started their companies in Maryland by combing databases, websites, news archives, and, when necessary, telephoning companies to determine what brought the founders to the state. The hypotheses they tested were:

- Entrepreneur was born here and either stayed or returned
- Entrepreneur came to Maryland for a job in another firm and left it to start own company
- Entrepreneur stayed in Maryland to start own company when employer left/closed/was acquired/laid off employees
- Entrepreneur came to Maryland for job in a federal laboratory
- Entrepreneur came to Maryland for a job in a university
- Entrepreneur came to Maryland to go to school
- “Serial” entrepreneur cashed out of previous start-up and started new company

³ Conclusions or opinions expressed in this publication are those of the authors and do not reflect the views of staff or others affiliated with the Institute for Policy Studies, The Johns Hopkins University, the Maryland Department of Business and Economic Development, or the Maryland Technology Development Corporation.

⁴ http://www.milkeninstitute.org/pdf/nstech_index04.pdf

Bio-, Medical, and Health Informatics Entrepreneurship in Maryland

Executive Summary

The numbers: 142 companies, over 85 percent homegrown, 145 known founders.

FINDINGS

These industries have only existed for about a decade and definitions of these nascent fields are still evolving.

The commercial application of information technology to biomedical research, development of diagnostics and therapeutics, and delivery of health care has a relatively short history. The industries are known variously as genomics, proteomics, bioinformatics, imaging informatics, health informatics, nursing informatics, medical informatics, healthcare automation and others.

The bio/med/health IT industry in Maryland is young.

Of the 108 companies for which a founding year is known, only 12 existed before 1980.

Maryland's research institutions give it key advantages in these new interdisciplinary industries.

Maryland's research institutions (universities and federal laboratories) are advancing knowledge across disciplines, educating a new generation of cross-trained health professionals and researchers, and supporting the development of infrastructure and standards.

Several of the key professional associations in the field are headquartered or have active chapters in Maryland.

The 3,200-member American Medical Informatics Association (AMIA) is based in Bethesda, the American Society of Health System Pharmacists (ASHSP) is also based in Bethesda and the 600-member Maryland Health Information Management Association (MDHIMA) and the 1000-member Maryland Society of Healthcare Information Systems Management (MSHISM) are local chapters of national organizations.

Maryland's government contractors, particularly its systems integrators, are moving aggressively into the bio- and health informatics fields.

Maryland's advanced information technology developers have also found biomedical and healthcare applications for their innovations.

Maryland's 142 bio/med/health IT companies span the full range of activities in these fields.

Biomedical research and drug development companies include those involved in: clinical trials management and support, computational neuroscience, genomics/proteomics/bioinformatics products and services, imaging and molecular imaging, laboratory automation, knowledge management and transfer, modeling, product development, research collaboration/management/support, research tools, and simulation. *Healthcare delivery (clinical informatics) companies* include those involved in: computer-assisted surgery, consumer-directed healthcare, decision-support systems, disease management, electronic (computer-based) patient record, imaging and PACS, nursing informatics, point-of-care computing, provider order entry systems, public health informatics, rehabilitation, and telemedicine. *Healthcare management companies* include those involved in credentialing, education for patients, education and training for staff, emergency department management, healthcare enterprise IT, healthcare enterprise market analysis and marketing IT, healthcare practice management, HIPAA

compliance, laboratory information systems, long-term care IT, managed care IT, medical language processing and transcription, network and security, pharmacy/drug management, and risk analysis and management, including quality control.

Almost all of Maryland's bio/med/health IT companies are homegrown, but the founders come from diverse backgrounds.

Over 85 percent of the companies for which founder data was available were started in Maryland. Sixty percent of the founders had worked in industry, 18 percent in universities, and 16 percent for the federal government.

- **Because so many of the bioscience companies in Maryland are genomics-related, many of the findings of the Maryland Bioscience Founders Report published by TEDCO in 2002 hold true in the bio/med/health IT sector, particularly the unusually high percentage of company founders who came from research institutions.**
- **Of the 68 corporations where Maryland bio/med/health IT entrepreneurs worked previously, 25 were in biomedical or healthcare fields.**
- **Surprisingly few Maryland bio/med/health IT entrepreneurs previously worked in pure information technology companies; many had large company experience.**
- **Very few of Maryland's bio/med/health IT entrepreneurs had previous experience in similar companies or ventures.**

The majority of both bio- and health- IT company founders hold advanced degrees, from colleges and universities in the U.S. and abroad.

While the number of advanced degrees was not surprising among the bioinformatics founders, the prevalence among the health informatics entrepreneurs suggests that these fields require specialized knowledge, either in business or science or both. Approximately one-third of the degrees were from area (including D.C.) universities and colleges.

Several of Maryland's bio/med/health IT companies have diverse international ties.

A health care information security firm is based in London and Glenwood, Maryland. An Annapolis imaging company is commercializing Swiss technology and a Rockville incubator houses a genomics company incubated initially in Israel. Several companies outsource healthcare-related IT services to transcribers, programmers, and IT solutions staff in India, Russia, and Egypt.

Venture capital has flowed unevenly within this diverse group of industries.

Venture capitalists have been responsible for starting a number of Maryland bioinformatics and medical informatics companies, as well as supplying financing to many others. A different group of venture capital firms have funded health informatics companies, which seem less likely to attract venture capital. Corporate venture financing has been made available to several imaging companies.

Like most other industries, the bio/med/health IT world is seeing substantial consolidation, particularly in healthcare-related companies.

Maryland companies have been among both the acquired and the acquiring.

IMPLICATIONS FOR POLICY AND PROGRAMS

Maryland leaders need to:

Provide an open-armed experience for graduate students and post-doctoral and visiting fellows while they are in Maryland, exposing them if possible to some of the state's successful bioscience entrepreneurs.

Work with universities and federal laboratories to identify and encourage interdisciplinary initiatives and research groups that are focused on the intersections of information technology and bioscience and health care. Support university/federal lab/corporate research centers of excellence at the frontiers of grand challenges in these fields, including NSA's informatics initiatives, NSF-supported computer-assisted surgery, molecular imaging, and bioinformatics data mining.

Establish a regular presence at the gatherings of professional associations in these industries, for two purposes. First, to make a concentrated effort to get to know bio/med/health IT company managers and to celebrate their successes. Also, to understand the dynamics and needs of their fields, and to work together on policy initiatives, standards, and other efforts to strengthen these hybrid industries in which Maryland has competitive strengths. Secondly, to foster the start-up of new companies, knitting them into existing networks of support for Maryland entrepreneurs.

Include bio/med/health IT strengths in Maryland's marketing and promotion strategies and collateral materials. MDBio's excellent inventory and promotions of the state's bio-tools infrastructure can be usefully incorporated into the state's marketing efforts. Bioinformatics companies generally require less specialized facilities than drug development bioscience companies, and therefore are more footloose. Precious assets that are highly coveted by other states, they deserve a concerted retention effort.

Create opportunities for Maryland buyers and sellers of bio/medical/health IT products and services to interact. Vendors benefit from deeper understanding of purchaser needs and requirements, and purchasers benefit from increased awareness of what is available from local suppliers. Both may find that co-development of new custom-designed products may not only solve an immediate problem, but also open up new markets.

Provide opportunities for enhanced interaction among Maryland providers and users in order to facilitate partnering that better responds to customer needs. Take advantage of NIH, NSF, and other federal funders' support for collaborative tools.

Foster advances in telemedicine that enhance access to state-of-the-art health care throughout Maryland, another benefit of regular interaction among Maryland providers and users of bio/med/health IT products and services.

Find ways to redouble support for the financiers who are matching cutting edge science with seasoned management to launch new bio companies in Maryland.

Understand the financing requirements of all types of companies in this cluster of industries, and make sure that private and public resources are available to support their growth.

Make sure that state education and training systems anticipate and respond to the requirements for a robust pipeline of new skilled bio/med/health IT workers, and continuing education for health care, research, and drug development workers to keep up with new technology developments.

Fully exploit Maryland's international networks to reach bio/med/health IT companies and entrepreneurs around the world.